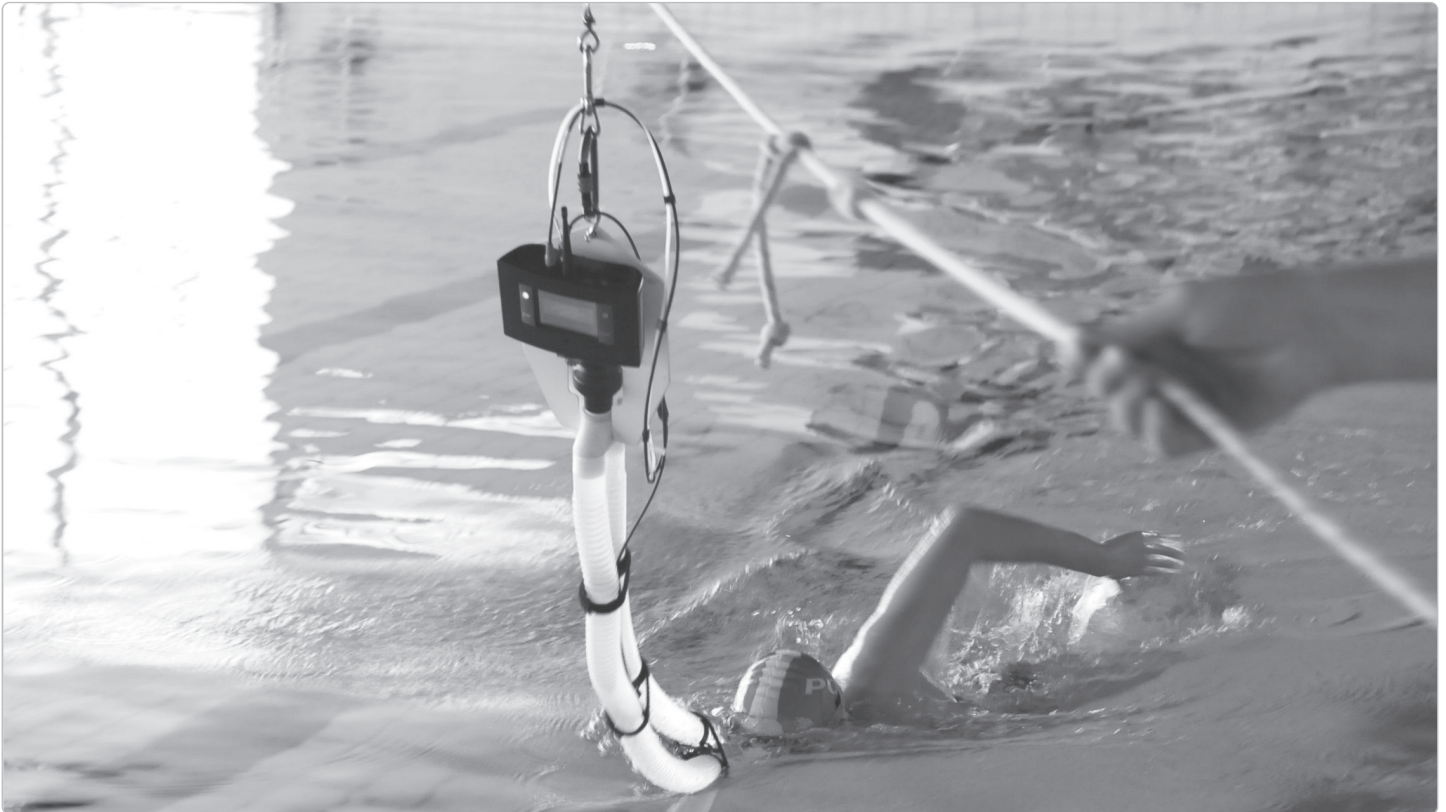


Aquatrainer

Innovative Snorkel for enhanced Breath-by-Breath Gas Analysis during Swimming



- ▶ Breath by Breath data acquisition during swimming (VO_2 , VCO_2 , VE, HR)
- ▶ Light and hydrodynamic design
- ▶ Ergonomic, waterproof and easy to mount
- ▶ High accuracy and proven reliability scientifically validated

Aquatrainer is an easy-to-mount swimming snorkel connected to COSMED wearable metabolic systems that allows to perform gas exchange analysis during swimming.

Swimming with the snorkel is considered a valid field condition to measure swimmers' cardio-respiratory response. Researchers and coaches can now acquire an incredible number of information on athletes tested in real conditions (swimming pool or flume).

In the Aquatrainer swimming snorkel the inlet and outlet tubes are connected to the turbine through a connecting unit that allows the system to distinguish expiration from inspiration, thus allowing the definition of tidal volume and respiratory frequency for BxB analysis. Gas sampling and turbine flowmeter are positioned at the output of the tube far enough from the water surface to guarantee reliability and subject's safety.

The snorkel is light, hydrodynamic and designed to suit swimmer's natural movements in different swimming styles (either front crawl or backstroke). Ergonomically designed components allow special protection to prevent water inhalation during test.

The Module includes also a special water-resistant HR belt and probe to measure heart rate frequency during swimming.

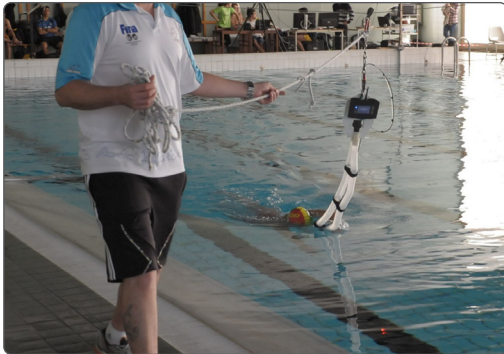
The Aquatrainer system has been validated (C. Baldari et al. 2013) and it is considered suitable for steady state measurement and incremental tests of 200m each (Fernandes RJ et al. 2012; de Jesus K et al. 2014). Moreover, Aquatrainer does not lead to an increase in active drag during front crawl performed at a large range of velocities (Ribeiro J et al. 2016).





Option 1:

The wearable metabolic system (K5 or K4 b²) can be hung on a cable to be placed above the swimming pool lane.



Option 2:

An operator can follow the swimmer by holding the wearable metabolic system (K5 or K4 b²) using a special rod (included in the standard packaging).

Technical Specifications

| Product | Description | |
|---|---|--------------|
| Aquatrainer | Module for gas exchange analysis during swimming | |
| Hardware | | |
| Dead space (mouthpiece) | 7 mL | |
| Canalization tubes (INS/EXP) length | 100 cm | |
| Modules | Standard Packaging | REF |
| Aquatrainer Module (requires Product Kit) | Aquatrainer unit, Aquatrainer silicone mouthpiece (2 pcs), corrugated pipe (2 pcs), Aquatrainer rod assembly and case, Aquatrainer backpack, adapters and fittings. | C04470-01-11 |
| Aquatrainer K5 Product Kit | K5 support Aquatrainer assembly, K5 Aquatrainer HR receiver probe, HR belt | C04480-02-11 |
| Aquatrainer K4 b ² Product Kit | K4 b ² support Aquatrainer assembly, BNC/RF headed cables, Aquatrainer HR/TA receiver probe | C04480-01-11 |

Validation Studies:

Fernandes RJ, de Jesus K, Baldari C, de Jesus K, Sousa AC, Vilas Boas JP, Guidetti L. (2012). Different VO₂max time-averaging intervals in swimming. *INTERNATIONAL JOURNAL OF SPORTS MEDICINE*, vol. 33, p. 1010-1015, ISSN: 0172-4622, doi: 10.1055/s-0032-1316362

de Jesus K, Guidetti L, de Jesus K, Vilas-Boas JP, Baldari C, Fernandes RJ (2014). Which are the best VO₂ sampling intervals to characterize low to severe swimming?. *INTERNATIONAL JOURNAL OF SPORTS MEDICINE*, vol. 35, p. 1030-1036, ISSN: 0172-4622, doi: 10.1055/s-0034-1368784

Baldari C, Fernandes RJ, Meucci M, Ribeiro J, Vilas-Boas JP, Guidetti L. (2013). Is the new AquaTrainer® snorkel valid for VO₂ assessment in swimming? . *INTERNATIONAL JOURNAL OF SPORTS MEDICINE*, vol. 34, p. 336-344, ISSN: 0172-4622, doi: 10.1055/s-0032-1321804.

Ribeiro J, Figueiredo P, Guidetti L, Alves F, Toussaint H, Vilas-Boas J.P, Baldari C, Fernandes, R.J. (2016). AquaTrainer® Snorkel does not Increase Hydrodynamic Drag but Influences Turning Time (Article). *INTERNATIONAL JOURNAL OF SPORTS MEDICINE*, vol. 37, p. 324-328, ISSN: 0172-4622, doi: 10.1055/s-0035-1555859



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